Terms of Reference for:-

"Engagement of a Consultant for implementation and monitoring of Third-Party Inspection (TPI) Report of different materials, procured & to be procured by the Agencies, of World Bank funded project, WBMIFMP, Irrigation & Waterways Directorate, Government of West Bengal."

West Bengal Major Irrigation and Flood Management Project [WBMIFMP]

[Funded by World Bank: AIIB: GoWB]

Irrigation & Waterways Department
Government of West Bengal, India

ABBREVIATION

AIIB	Asian Infrastructure Investment Bank
BDO	Block Development Officer
CE& PD	Chief Engineer& Project Director
DLTSC	District Level technical Steering Committee
DM	District Magistrate
DPIU	District Project Implementation Unit
DPMU	District Project Management Unit
ECS	Electronic Clearance Services
GOI	Government of India
GOWB	Government of West Bengal
IBRD	International Bank for Reconstruction and Development
IWD	Irrigation and Waterways Department
MIS	Management of Information System
PMC	Project Management Consultants
SLTSC	State Level Technical Steering Committee
SPMU	State Project Management Unit
WB	World Bank
WBMIFMP	West Bengal Major Irrigation Flood Management Project

Contents

1.0 Background

The Government of India has received financing of USD 290 million from the International Bank for Reconstruction and Development (IBRD)and AIIB towards the cost of the **West Bengal Major Irrigation and Flood Management Project (WBMIFMP)** and intends to apply a part of the proceeds toward eligible payments under the contracts for Consultancy Services. The sub – borrower is Irrigation & Waterways Department, Government of West Bengal.

WBMIFMP aims to improve the existing irrigation network in the Damodar Valley Command Area (DVCA) within the State of West Bengal, to optimize conjunctive and sustainable use of ground and surface water across the DVCA in different irrigation seasons, and to reduce flooding in the Lower Damodar Sub-Basin (LDSB) in West Bengal.

The duration of the project as envisaged now is for 6 (six) years. The Project is being be executed by the Irrigation and Waterways Department (IWD) of the Government of West Bengal (GoWB) located at Kolkata and the Project Management Unit (PMU) is the implementing agency / employer (SPMU, IWD). The support of the Project Management Consultant (PMC) will be at the PMU at various levels viz the State Project Management Unit (SPMU), the District Project Management Units (DPMUs) and the District Project Implementation Units (DPIUs) and is expected to fully compliment the SPMU, DPMUs and DPIUs in the execution of the Project in all aspects under overall control of the IWD at the SPMU. The Consultant may note that the execution of the Project will be decentralized with District Units of IWD and the support will extend to the field units as well.

2.0 Overview of the Project

The Damodar River originates from the Chhotonagpur Plateau at Latehar District in Jharkhand and flows through the districts of Latehar, Hazaribagh in Jharkhand and enters Purulia District in West Bengal which is the lowermost riparian State in Damodar Basin. Five reservoirs have been built on the Damodar and its tributaries in Jharkhand to moderate floods in the lower basin area in West Bengal and for irrigation. These are operated by Damodar Valley Corporation (DVC). The Damodar River bifurcates into two main branches, i.e.Mundeswari and Lower Damodar (Amta Channel) near the border of Burdwan and Hooghly Districts, and both the channels traverse through the districts of Hooghly and Howrah, and ultimately meet River Hooghly, which debouches into Bay of Bengal.

3.0 Project Area:

The project area considering both irrigation and flood management aspects is as follows:

Irrigation:

Northern Boundary: River Ajoy at Parulia, Block Katwa-I, District Burdwan (Latitude 233851 N).
Southern Boundary: Outfall of Nabinbabur Khal at Block Amta-I, District Howrah (Latitude 223547 N).
Western Boundary: Durgapur Barrage on river Damodar at Block Barjora, District Bankura (Longitude 871813 E).
Eastern Boundary: Howrah Burdwan Main Line of Eastern Railway at Nityanandapur, Block Balagarh, District Hooghly (Longitude 882517 E)

Flood management:

Northern Boundary: Bifurcation point of river Damodar into Mundeswari River and Amta Channel at Beguahana, Block Jamalpur, District Burdwan (Latitude 23088.34 N).

Southern Boundary: Outfall of Amta Channel in river Hooghly, Block Shyampur-I, District Howrah (Latitude 222059.76 N).

Western Boundary: Ichhapur at Block Khanakul-I, District Hooghly (Longitude 87450.43 E).

Eastern Boundary: River Saraswati at Eklakhi, Block Chanditala-II, District Hooghly (Longitude 881633.89 E).

The schematic drawing, brief project outlay, location and other particulars are available on the website *www.wbiwd.gov.in* in the link **"**WBMIFMP**".**

4.0 Project Components

The irrigation network downstream of the Durgapur Barrage (West Bengal) was developed more than 6 decades ago and is now degraded. This system is managed by IWD of GoWB. Dilapidated hydraulic infrastructure, loss of irrigation water due to seepage and silted distribution networks have reduced the system's efficiency and led to water scarcity, particularly at the tail reaches. As a result, the gap between irrigation potential created vis-à-vis utilized is increasing, despite adequate water availability (around 140,000 hectare-meter (ha-m) for 332,000 hectare (ha) of command area under Kharif irrigation on an average). This is only 20% of the total water availability at the barrage during monsoon. Tail end farmers are compelled to abstract groundwater, which increases the costs of cultivation. This trend increases when rainfall is erratic or insufficient.

There is an urgent need to enhance the reliability and efficiency of water supply to increase water productivity and crop production, and to increase the amount of water that reaches tail-end areas. In response to these challenges, the West Bengal Major Irrigation and Flood Management Project (WBMIFMP) has been conceived. It aims to (i) ensure that water is distributed more equitably across the project command area, (ii) use of reduced water from the reservoirs during Kharif for Rabi irrigation and (iii) reduce flooding as much as can feasibly be achieved. A suitable system for real-time operation and monitoring of the irrigation management system, and private sector participation in operation and maintenance are being explored.

The project is structured under the following Components:

Component A: Irrigation Management - The component includes the following subcomponents: (i) Establishment of Management Information System (MIS), (ii) Improving the Quality of Service Delivery, (iii) Aquifer Management, and (iv) Capacity Strengthening.

Component B: Modernization of Irrigation Infrastructure - This component will invest in the modernization of irrigation infrastructure of the main (level 1), branch (level 2), distributary (level 3), and minor and sub-minor canals (level 4). Structural interventions on the canals include: desilting and reforming (restore shape and bank height) of selected canal sections across all canal levels; canal lining of unstable canal sections to ensure renewed canal section stability and hydraulic capacity; rehabilitating existing damaged flow control structures to restore and/or improve function, including measures to address foundation scour, structural degradation and mechanical

wear; improved irrigation management by real time flow data collection through sensors and mobile app to serve as inputs in the decision support system and to perform need-based operation to ensure need based and equitable distribution of canal water at the entry point of *chaks*; improving of outlet structures (fully closeable and lockable), further ensure need-based supply and to avoid water wastage; and improving weirs and drop structures and arrangement of tail regulation as needed to maintain operational head in canals; sub-surface pressurized pipe systems that will deliver water to faucets on each plot; and cross regulator construction.

Component C: Flood management - This Component will invest in structural measures to reduce flooding in the Project area. Structural measures will include investments to ensure that the flood flow discharge is more evenly shared between the Mundeswari and Amta Channel. Increasing flood discharge capacity in Mundeswari requires desiltation to restore/increase the low flood to moderate flood discharge capacity to reduce/limit peak discharge that will be shared in the Amta Channel for all flood events.

Component D: Project Management - This component will strengthen capacity of the Project Management Unit set up for management of the project, monitoring and evaluation (M&E) (including, inter alia, the areas of procurement and financial management) through the provision of inventories, consultant services, training, and financing of incremental operating costs. Intermediate results indicators include the number of Project monitoring reports submitted on time annually. This component will (i) finance the preparation of several technical studies.

5.0 Implementation Arrangements

Project Implementation Arrangement within the Govt. of West Bengal:

At the State level, a Technical Steering Committee (SLTSC) headed by the Chief Secretary has been established and consists of the Heads of all concerned Departments. The SLTSC will review preparation and implementation progress, coordinate between Departments and provide guidance on policy matters

IWD Govt. of WB is responsible for project implementation. It has set up a State Project Management Unit (SPMU) headed by a Project Director (PD) / Chief Engineer of the IWD. The PD is supported by two Additional PDs / Superintending Engineer (SEs), 4 Deputy PDs / Executive Engineers (EEs), Accounts Officials and other support staff. Nodal officers from the Agriculture, Agri-Marketing, Fisheries, Horticulture & Food Processing Industries and Water Resources Investigation and Development Department (WRIDD) are members (Partner Departments) of the SPMU. At the district level, two District Project Management Units (DPMUs) have been established (one for Howrah and Hooghly, and one for Bankura, Purba Bardhaman and Paschim Bardhaman) for coordination and monitoring which are headed by Additional Project Directors. The DPMUs are functional with a skeleton staffing structure. Other implementing departments will also be represented in the DPMUs by concerned district level officials. During project implementation, project components and sub-components execution will be overseen by the District Project Implementation Units (DPIUs) headed by the Deputy Project Directors/Executive Engineers in case of IWD and by other appropriate district level officers of partner departments. While the DPIUs of IWD will be full-time dedicated staff, such DPIUs of other Departments will implement project components in addition to their own duties.

6.0 Sub-project launched:

The Irrigation & Waterways Department has launched 10 civil works packages at the initial stage of investment for flood protection measures on Damodar Left Embankment and Damodar Right Dwarf Embankment, Upper Rampur Khal Left Embankment, Hurhura Khal Left Embankment, desiltation of Mundeswari River, desiltation of Madaria Khal and desiltation of Roner Khal. The said 10 civil works project covers mainly in Howrah and Hooghly and part of Purba Bardhaman district.

7.0 Objective and Scope of works of Consultant: - SPMU is going to conduct Third Party Inspection (TPI) of the materials already procured and to be procured for four (4) numbers packages (Packages I, II, III and IV) all of which are being executed by L & T Geo-Structure Pvt Ltd. Schedule of Testing and Sampling Frequency of Construction Material for the said TPI has been prepared by SPMU according to the relevant provisions of BIS and other codes, which is enclosed in Annexure-I. The relevant quality parameters for these procured/still to be procured materials must adhere to the relevant codal provisions/parameters set up in the schedule as in Annexure-I. The sampling frequency must also adhere to the relevant codal provisions/parameters set up in the schedule as in Annexure-I.

7.1 Tasks for Consultant: - At the very onset, it is mandatory on part of the Consultant to discharge the entrusted assignments with total conformity to COVID-19 protocols in vogue, from time to time, as decided by concerned Government.

7.2 Communication of quantum of materials: -The consultant will be thoroughly acquainted with the quantity of already procured material in the corresponding stackyard/storage places. Procurement Schedule of different construction materials of respective contract packages will be provided to the consultant by the PMCs of corresponding Contract Packages.

7.3 Arrangement of NABL Accredited laboratories: - For the purpose of testing of materials, only laboratories with due NABL accreditation for specific purpose of testing is allowed. Different materials which will be required for testing, may not be arranged from a single laboratory source. In such cases, the consultant will be required to arrange due NABL accredited laboratories so as to accommodate all types of testing of all materials. The consultant is required to produce documents detailing the testing capabilities/facilities in each such laboratory. These documents must be accompanied with valid NABL certificates. If during pendency of contract, date of effectiveness of NABL certification expires, the same must be informed to PMC forthwith & fresh intimation about renewal of certification or engagement with other NABL certified lab to be done immediately.

7.4 Location of NABL accredited laboratories: - it is desirable that the said laboratories be located within vicinity of project area, within the 2 districts of Howrah, Hooghly and Kolkata Metropolitan Area.

7.5 Carriage of Materials: - The Consultant engaged for the purpose of Third Party Inspection will be solely responsible for making all necessary arrangements so as to reach the pre-determined laboratories in spoil proof and secured conditions, adhering to concerned codal provisions. The Consultant will intimate at least 2 working days in advance to the concerned PMC about such

carriage of materials to its designated laboratory, who will in turn intimate the contractor about it to facilitate the program. This intimation will be duly conveyed by PMC to DPIU's in turn.

7.6 Testing of Materials: -With reference to the Schedule for Testing of various materials, the consultant will do the tests in the laboratories as specified in 7.3 above. Authorised personnel on behalf of Consultant, PMC of concerned contract packages and Contractor may be present during such testing. Authorised personnel from the end of DPIU, may also be present, if it wishes so. In the test report, signature of Authorised personnel of Consultant is mandatory.

8.0 Condition of Services

8.1 Duration of Services: -The duration of services will be up to a period of 10.5 months which may change as per requirement. All documents prepared, generated or collected during the period of contract, in carrying out the services under this assignment will be the property of IWD. No information gathered or generated during and in carrying out this assignment shall be disclosed by the Consultant without explicit permission of SPMU.

8.2 Location of Consultant: - The Consultant will have its central office at a location mutually agreeable between SPMU and the Consultant. In addition to it, the Consultant must have its site offices at a convenient location for each and every Package for packages I,II,III and IV.

8.3 Reporting: - The Consultant will be liable to make arrangement with its designated laboratories so that the test report in electronic format, i.e via Fax, Email, WhatsaApp is available to the PMC on the next calendar day after completion of any test, be it phasewise or conclusive. The PMC will convey the test result to both DPIU and Contractor at the earliest after receiving the test result. The hard copies of the test result will have to be physically submitted to PMC within 2 working days from communication via electronic format. All supporting documents such as Data Sheet for schedule of procurement of different materials for different packages, Schedule of carriage of materials to designated laboratories, to be submitted to DPIUs through PMC. The reporting frequency as well as format of reporting may be updated as per the guidance of the PMC from time to time. During test operations, the Consultant shall ensure traceability between test specimens and test units to which they belong and this should be reflected in test report. Representative test specimen must be preserved by the Consultant in case of any disagreement about test result from the end of contractor or PMC.

8.3.1 Inception Report:-The Consultant shall submit an inception report detailing plan of action, manpower deployment, time schedule, and detailed methodology, **within 14 days** of the commencement of the assignment to the SPMU through the PMC.

8.3.2 Monthly / Interim Progress Reports: -The Consultant shall submit progress reports on the activities carried out during the month by the 7th of subsequent month, to the PMC. The progress reports shall

include data as required by SPMU with work charts as against the scheduled time frame of Testing frequency of different materials at designated laboratories.

8.3.3 Monthly Work Plan: - The work plan for each coming month shall have to be submitted by Consultant to PMC with in the 10 days of the end of the month along with that of the current month clearly showing data sheet of intended procurement of materials to be done by the contractor, sampling frequency of existing stacks of materials, proposed carriage of materials to designated NABL accredited laboratories. Such data sheet of intended procurement will be provided to the Consultant by the Contractor.

9.0 Data, Services and Facilities to be provided by the Client:

The SPMU will provide to the Consultant copies of the available Contract Documents of all the 4 packages of Packages I, II, III and IV, Schedule of materials to be tested and total quantum of materials to be procured by contractor during execution of Project from time to time. The procurement team from the end of the contractor will intimate the consultant as well as PMC and DPIU about this from time to time for phase wise procurement of materials for the relevant packages.

10.0 Composition of Committee to monitor Consultant's work

A Review Committee will be formed to review the reports and confirm acceptance of deliverables comprising of the following members.

Chairman
Additional Project Director- IV, DPMU-II, WBMIFMP
Permanent Members
Deputy Project Director (CIVIL) –VI, , DPMU-II, Member Convenor
Executive Engineer, Howrah Irrigation Division
Executive Engineer, Hooghly Irrigation Division
Team Leader of PMC
Project Manager, PMC of concerned work packages I, II, III & IV

This committee will accord clearance to the deliverables of the Consultant. This committee, if desired, can include any Officers/Experts, if deems fit at any point of time.

N.B.- The quorum of the Committee would be formed if the Chairman and any two (2) out of the remaining five (5) remain present.

11.0 Schedule of Delivery of the Reports:

Sl. No.	Activities	Schedule of Delivery
A.	Inception report with a description of Assignment scope, detailing plan of action, manpower deployment, time schedule, and detailed methodology–three hard copies along with electronic/softcopy need to be submitted	Within 14 calendars days of Signing the agreement
B.	Monthly Report/Interim Progress Report as in 8.3.2	Progress reports on the activities carried out during the month by the 7th of subsequent month, to the PMC or as directed by PMC.
C.	Final Report	At the end of completion of Physical Work of all relevant Bid Packages.

12.0. Team for Assignment

The Consultant shall depute a team of professionals to the Project site as well as Laboratory site. The constitution of the Core Team and their required qualification and experience shall be following: -

Sl. No.	**Key Position**	**Minimum Number professional**	**Experience /Qualification**
1.	Team Leader	1	**Qualification:** Team Leader should be a graduate, preferably in Civil /Mechanical/Chemical/Metallurgy Engineering or post graduate in Material Sciences or equivalent. ***Experience:*** S/he should have minimum 10 years' experience in implementation of Quality control testing of materials. S/He should have sound knowledge about I.S. Codes as well as relevant Foreign Codes for testing of different materials. S/He should be well acquainted with functioning of large quality control testing laboratories dealing with material testing.

2	Laboratory Engineer	3	**Qualification:** Laboratory Engineer should be a graduate, preferably in Civil /Mechanical/Chemical/Metallurgy Engineering. ***Experience:*** S/he should have minimum 05 years' experience in implementation of Quality control testing of materials. S/He should have sound knowledge about I.S. Codes as well as relevant Foreign Codes for testing of different materials.
3	Laboratory Technician	6	**Qualification:** Laboratory Technician should be a Diploma Engineer, preferably in Civil /Mechanical/Chemical/Metallurgy Engineering or equivalent. ***Experience:*** S/he should have minimum 03 years' experience in testing of different materials in relevant engineering testing machines.
4	Laboratory Assistant	4	**Qualification:** Laboratory Assistant should be a ITI Certificate Holder, preferably Machinist or equivalent. ***Experience:*** S/he should have minimum 03 years' experience in collection of samples from different materials.

In addition to these, the Consultant shall employ such non-key persons related to his regular office work, report preparation or any other assignment as deemed fit.

Annexure-I

Abstract of Material Consumption, Cost and Testing / Sampling to be Done for Third Party Inspection - FM Package I, II, III & IV

Sl. No.	Material To Be Tested	Total		Details of Tests	No. of Sample					IS code Provisions
			Unit		Pkg-I	Pkg-II	Pkg-III	Pkg-IV	Total	
1	Coal Tar	940322.22	kg	Soft Medium Pitch, Detection of Percent Pitch, Chemical Properties	8	8	8	8	**30**	Test to be done for soft medium pitch as per IS 216 and also for detection of Percent Pitch as defined in IS 334, IS equivalent or other relevant Sampling: Table 3, IS 216 Tests: Table 1, IS 216
2	Cement	38667.65	MT	Physical & Chemical Requirements as per IS 455 (for PSC) / IS 1489 - Part 1 (for PPC)	217	184	93	280	**773**	Tests to be done for acertaining conformity of supplied material as per in IS 455 (for PSC) & IS 1489 Part 1 (for PPC), IS equivalent or other relevant. Sampling IS 455:1989 (PSC) IS 1489 Part -1 (PPC)
3	Admixture	337725.75	MT	Tests as per Table 1A, IS 9103	5	5	2	8	**20**	Tests to be done for acertaining conformity of supplied material (superplasticizer) as per in IS 9103, IS equivalent or other relevant. Sampling: Table 1A, 1B & Clause 5, Pages 2 & 3 of IS 9103:1999
4	Construction Water	597284.43	Litre	Tests as per Table 1, IS 456 & pH Value	15	15	15	15	**60**	For Constructiuon Water: Tests to be done for acertaining conformity of supplied material as per in IS 456 & IS 3025, IS equivalent or other relevant. Sampling: IS 3025 (Relevant Parts)
5	Polythene Sheet	113639.25	Sqm	Appearance / Film form / Odour, Density, Melt Flow Index, Thickness & Tolerance, Width & Tolerance, Tensile Strength & Elongation at Breaking (Before & After Ageing) - Machine	4	4	2	2	**12**	Tests to be done for acertaining conformity of supplied material as per in IS 2508: 1984, IS equivalent or other relevant
6	Jhama Bricks	3819144.00	Nos	Crushing Strength, Effloration & Water Absprption Test	8	8	4	11	**30**	Tests to be done for acertaining physical properties as mentioned in IS 5779: 1986, IS equivalent or other relevant Sampling: Table 2, Page 6, IS 5454: 1978
7	Reinforcement Bars	5978.25	MT	Physical Property, Tensile Strength, Yeild Strength, Percent Elongation, Bend, Rebend, Chemical Composition	57	8	26	44	**134**	Tests to be done for acertaining conformity of supplied material as per in IS 1786:2008, IS 2062, IS equivalent or other relevant Sampling: IS 1786:2008, Clause 11.21, Page 8
8	Paint (Sheet Pile)	11920.18	Litre	Tests as per Table 2, IS 2932	10	8	7	7	**32**	Tests to be done for acertaining conformity of supplied material as per in IS 2932, IS equivalent or other relevant. Sampling; IS 101-1-1, Table 1, Page 3

Abstract of Material Consumption, Cost and Testing / Sampling to be Done for Third Party Inspection - FM Package I, II, III & IV

Sl. No.	Material To Be Tested	Total		Details of Tests		No. of Sample					IS code Provisions
			Unit			Pkg-I	Pkg-II	Pkg-III	Pkg-IV	Total	
9	Primer (Sheet Pile)	7450.11	Litre	Tests as per Table 1, IS 2074		8	7	5	5	**25**	Tests to be done for acertaining conformity of supplied material as per in IS 2074, IS equivalent or other relevant. Sampling; IS 101-1-1, Table 1, Page 3
10	Nylon Cage	60148.50	Nos	Tests as per Table 1, IS 4401, Confirmation of Material, Confirnation of Thread (210 X 24) having Tensile Strength not less than 250 kg/sq.cm		2	5	2	51	**60**	Tests to be done for acertaining conformity of supplied material as per in IS 4401, IS equivalent or other relevant. Sampling: IS 4401, Clause 8.3
11	Empty Cement Polythene Bags	1306635.00	Nos	Material Identification, Fabric (Tape Width), Sacks (Visual Appearance), Seam (Dimension), Identification (Stitching Material), Stitching Material Breaking Load, Valve for filling of Sockets (Visual & Dimension), Capacity, Dimensions, Ends per dm, Picks per dm, Mass of Sack, Average Breaking Strength & Elongation at Break of Fabric (Length & Width wise), verage Breaking Strength & Elongation at Break of Seam (Top & Bottom seam)		2	5	2	51	**60**	Tests to be done for acertaining conformity of supplied material as per Page: B-17, Clause 2.8, 2.8.1 of specification for works under USOR of I&WD, GoWB effective from 19.01.2018 Sampling: IS 11652:2000, Table 2, Page 3 Type of Test: IS 11652:2000, Table 1, Page 3
12	HDPE Bags	1040555.25	Nos	Length, Width, Ends per dm and Picks per dm, Mass of Sack (without tying cord), Average Breaking Strength of fabric, Min (Ravelled strip method, 325mm X 70mm), Warp way / Weft way		2	2	2	18	**25**	Tests to be done for acertaining conformity of supplied material as per in IS 2508, IS equivalent or other relevant. Sampling: IS 14252:2003, Table 2, Page 3 Type of Test: IS 14252:2003, Table 1, Page 2
13	PVC Water Stop	4672.95	m	Tests as per Table 1, IS 15058	Physical Properties	30	4	2	2	**38**	Tests to be done for acertaining for Hardness, Tensile strength, elongation, water absorption, cold bend temeperature test, Accilerated extraction test & stability in effect of alkali test as per IS 15058, IS equivalent or other relevant. Sampling: IS 15058, Annex D, Table 2, Page-4
					Chemical Properties	11	2	2	2	**18**	
14	Bituminous Fiber Board	4672.95	m	Tests as per Table 1, IS 1838 (Part 1)		11	2	2	2	**18**	Tests to be done for acertaining conformity of supplied material as per in IS 1838, IS equivalent or other relevant. Sampling: IS 1838, Clause 8, Page 7
15	Polysulphide Sealant	2056.10	kg	Rheological Properties, Plastic Deformation, Adhesion and Tensile Modulus, Application Life, Adhesion in Pill, Loss of mass after Heat Ageing and Staining		6	4	2	2	**14**	Tests to be done for acertaining conformity of supplied material as per in IS 12118, IS equivalent or other relevant. Sampling: IS 12118 (Part 1), Table 1, Page 7

Abstract of Material Consumption, Cost and Testing / Sampling to be Done for Third Party Inspection - FM Package I, II, III & IV

Sl. No.	Material To Be Tested	Total	Unit	Details of Tests		No. of Sample					IS code Provisions
						Pkg-I	Pkg-II	Pkg-III	Pkg-IV	Total	
16	Galvanized Iron Wire	60529.03	sqm	Mass of Zinc Coating, Uniformity of Zinc Coating, Adhesion Test, Tensile Strength, Bend Test, Wrapping Test, Chemical Composition	Physical Properties	19	19	11	49	**98**	Tests to be done for acertaining conformity of supplied material as per in IS 280, IS equivalent or other relevant. Sampling: IS 280, Table 3, Page 3
					Chemical Properties	8	8	4	8	**26**	
17	Geotextile	595590.68	sqm	Weight, Tensile Strength Warp / Weft, Elongation at Specified, Tensile Strength Warp / Weft, Trapezoidal Tearing Strength Warp / Weft, Puncture Strength, Water Flow, Average Opening Size, UV Resistance after 500 hrs.		15	16	8	20	**59**	Tests to be done for acertaining conformity of supplied material as per Clause 2.7.7 of specification for works under USOR of I&WD, GoWB effective from 19.01.2018, IS equivalent or other relevant. Sampling; Clause 2.7.7 of specification for works under USOR of I&WD, GoWB
18	MS Structural Steel	4.52	MT	Tensile Strength, Yeild Strength, Percent Elongation, Bend, Chemical Composition		2	2	2	2	**9**	Tests to be done for acertaining conformity of supplied material as per in IS 2062, IS equivalent or other relevant. Sampling: Product Manual: IS 2062, Grouping Guidelines Page 2
19	Fine Aggregate	83026.01	MT	Tests as per Table 2, IS 383		95	71	36	94	**295**	Tests to be done for acertaining conformity of supplied material as per in IS 2430 & IS 383, IS equivalent or other relevant. Sampling IS 2430, Table 1, Page 5 IS 383: 1970
20	Coarse Aggregate	148139.56	MT	As per Table 2, IS 383, Combined Flakiness & Elongation Index, Aggregate Crushing Value, Aggregate Impact Value, Aggregate Abrasion Value, Alkali Aggregate Reaction.		170	125	63	167	**524**	Tests to be done for acertaining conformity of supplied material as per in IS 2430 & IS 383, IS equivalent or other relevant. Sampling IS 2430, Table 1, Page 5 IS 383: 1970